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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
LEE, JAE	

ART UNIT	PAPER NUMBER
2895	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/583,914	BIJKER ET AL.	
	Examiner	Art Unit	
	JAE LEE	2895	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 February 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4-25 and 27-37* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4-25,27-37* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Allowable Subject Matter

1. The indicated allowability of **claims 1 and 20 (as well as claims 4, 27, and 28** are withdrawn in view of the newly discovered reference(s) to Ichihara et al. Rejections based on the newly cited reference(s) follow.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. **Claims 1, 2, 4-9, 11-15, 17-25, 27, 30, and 34-36** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ichibara et al. (Pub No. US 2003/0193857 A1, hereinafter Ichibara et al.) in view of Chistyakov (USP# 6,903,511 B2, hereinafter Chistyakov).

With regards to **claim 1**, Ichibara et al. teaches a method for manufacturing a functional layer, comprising:

introducing a substrate into a process chamber (see ¶130, disk substrate 101);

generating a plasma by a RF plasma source (see ¶130, RF sputtering in Ar plasma utilized);

depositing a first deposition material on the substrate under the influence of the plasma, wherein, at the same time, applying a second deposition material to the substrate with a second deposition process (see ¶130, first deposition material AlSb while at the same time depositing second deposition material SiO_2);

wherein the functional layer has no catalytic function and forms a coating selected from the group consisting of anti-reflective, heat-resistant, and optical coatings (see ¶130, no catalytic activity, the film can be classified as either an optical coating or heat-resistant film).

A volatile compound of the first deposition material is supplied to the plasma for the deposition (see ¶130, AlSb in plasma state, volatilized).

Ichibara et al., however, does not teach utilizing a DC plasma source.

In the same field of endeavor, Chistyakov teaches the use of a DC plasma source since it can be advantageous of reducing probability of establishing electrical breakdown condition leading to an undesirable electrical discharge (see col. 3, lines 57-67).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to incorporate a DC plasma source since it can be advantageous of reducing probability of establishing electrical breakdown condition leading to an undesirable electrical discharge

With regards to **claim 2**, Ichibara et al. teaches a method according to claim 1, wherein the first deposition material is supplied to the plasma outside the plasma source in the process chamber (see

With regards to **claim 4**, Ichibara et al. teaches a method to **claim 1**, wherein the volatile compound contains a precursor material which decomposes the first deposition material in the process chamber before the first deposition material has reached the substrate (see ¶130, first deposition material from a target that is decomposed from plasma hit to provide sputtering)..

With regards to **claim 5**, Ichibara et al. teaches a method according to **claim 1**, wherein the second deposition process is sputtering (see ¶130, sputtering utilized for AlSb / SiO_2 film).

With regards to **claim 6**, Ichibara et al. teaches a method according to **claim 1**, wherein a sputtering electrode comprising the first and/or the second deposition material is arranged in the process chamber, wherein the plasma is brought into contact with said sputtering electrode to sputter the substrate with the first and/0r the second deposition material of the electrode (see ¶130, sputtering technique utilized with plasma Argon gas to sputter AlSb target onto substrate).

With regards to **claim 7**, Ichibara et al. teaches a method according to **claim 6**, wherein the plasma is passed at least partly through a passage of the sputtering electrode to contact the plasma with the electrode (see ¶130, sputtering gas argon sputters AlSb target).

With regards to **claim 8**, Ichibara et al. teaches a method according to **claim 7**, wherein the sputtering electrode contains compressed powders of the first and/or second deposition materials to be deposited on the substrate (see ¶130, AlSb target is comprised of compressed powders).

With regards to **claim 9**, Ichibara et al. teaches a method according to **claim 1**, wherein the substrate comprises sheet material (see ¶130, optical disk substrate is a sheet).

With regards to **claim 11**, Ichibara et al. teaches a method according to **claim 1**, wherein the substrate is brought from an environment into the process chamber and is discharged from the process chamber to the environment while the deposition material is deposited on the substrate in the process chamber (see ¶130, disk taken out of the chamber after layers are applied).

With regards to **claim 12**, Ichibara et al. teaches a method according to **claim 1**, wherein the substrate is substantially non-porous and comprises a metal or plastic (see ¶130, optical disk made of a plastic polycarbonate).

With regards to **claim 13**, Ichibara et al. teaches a method according to **claim 1**, wherein the substrate comprises a carrier material (see ¶130, polycarbonate is a carrier material).

With regards to **claim 14**, Ichibara et al. does not teach a method according to **claim 1**, wherein the substrate comprises a metal and/or an alloy.

In the same field of endeavor, the selection of a known material based on suitability for its intended use is prima facie obviousness (see *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945)).

With regards to **claim 15**, Ichibara et al. teaches a method according to **claim 1**, wherein the substrate comprises corrugated material.

In the same field of endeavor, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to merely select a configuration of a substrate absent persuasive evidence that the particular configuration of the substrate was significant (see *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966)).

With regards to **claim 17**, Ichibara et al. does not teach a method according to **claim 1**, wherein the first and/or second deposition material is deposited such that the chemical composition of the deposited material measured over distances of 5 cm.

In the same field of endeavor, it would have been obvious to one of ordinary skill to determine the optimum distance (see *In re Aller, Lacey, and Hall* (10 USPQ 233-237). It is not inventive to discover optimum or workable ranges by routine experimentation. Note that the specification contains no disclosure of either the critical nature of the claimed ranges or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen dimensions or upon another variable recited in a claim, the applicant must show that the chosen dimensions are critical (see *In re Woodruff*, 919 f.2d 1575, 1578, 16 USPQ 2d 1934, 1936 (Fed. Cir. 1990)).

With regards to **claim 18**, Ichibara et al. teaches a method according to **claim 1**, wherein the substrate is adjusted to a particular electrical potential by DC, pulsed DC and/or RF biasing (see ¶130, RF can be utilized).

With regards to **claim 19**, Ichibara et al. teaches a method according to **claim 1**, wherein the substrate is adjusted to a treatment temperature (see ¶130, there is a temperature when performing the process).

With regards to **claim 20**, Ichibara et al. teaches an apparatus for manufacturing a functional layer on a substrate, comprising:

a process chamber (see ¶130, sputtering chamber);

a first deposition material source configured to introduce a first deposition material into the plasma (see ¶130, first deposition material source AlSb);

a substrate positioning device configured to bring and/or keep at least a part of a substrate in such a position in the process chamber that the substrate contacts said plasma (see ¶130, optical disk being coated is held by a positioning device);

a second deposition material source configured to deposit a second deposition material on the substrate at the same time as the plasma source, wherein the functional layer has no catalytic function and forms a coating selected from the group consisting of anti-reflective, heat-resistant, and optical coatings (see ¶130, second deposition material SiO_2 same time applied as AlSb source, layer has no catalytic function, coating could be heat-resistant or optical coating).

A fluid supply channel configured to supply the first deposition material to be deposited, in a volatile state, to the plasma (fluid could also mean gaseous state, volatilized state in ¶130, AlSb volatilized by plasma)

Ichibara et al., however, does not teach utilizing a DC plasma source.

In the same field of endeavor, Chistyakov teaches the use of a DC plasma source since it can be advantageous of reducing probability of establishing electrical breakdown condition leading to an undesirable electrical discharge (see col. 3, lines 57-67).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to incorporate a DC plasma source since it can be advantageous of reducing probability of establishing electrical breakdown condition leading to an undesirable electrical discharge.

With regards to **claim 21**, Ichibara et al. teaches an apparatus according to claim 20, wherein the second deposition material source is a VD source, including a CVD source, a PVD source, or a PECVD source (see ¶130, sputtering is a PVD source).

With regards to **claim 22**, Ichibara et al. teaches an apparatus according to claim 20, wherein the second deposition material source is configured to carryout deposition processes including: PECVD, CVD, PVD, sputtering, hollow-cathode sputtering, vapor deposition using boats, e-beam, and/or supported by an ion process, ion plating, microwave deposition, ICP (inductive coupled plasma), parallel-plate PECVD, and/or honeycomb electrode structures (see ¶130, sputtering process utilized).

With regards to **claim 23**, Ichibara et al. teaches an apparatus according to claim 21, wherein the second deposition material source comprises a sputtering electrode containing the first and/or the second deposition material to be deposited, wherein the sputtering electrode is positioned such that, during use, the plasma generated by the plasma source sputters the first and/or the second deposition material from the sputtering electrode onto the substrate (see ¶130, sputtering technique utilized with plasma Argon gas to sputter SiO_2 target onto substrate).

With regards to **claim 24**, Ichibara et al. teaches an apparatus according to **claim 23**, wherein the sputtering electrode is arranged downstream of the plasma source and is provided with a plasma passage to allow the plasma to pass from the source to the substrate (see ¶130, sputtering target SiO_2 arranged whereby plasma particles can sputter the target and deposit on substrate).

With regards to **claim 25**, Ichibara et al. teaches an apparatus according to **claim 23**, wherein the sputtering electrode abuts the plasma source (see ¶130, in sputtering process, the plasma source and the sputtering electrode target should be adjacent to one another).

With regards to **claim 25**, Ichibara et al. teaches an apparatus according to **claim 23**, further comprising a fluid supply channel configured to supply the first deposition material to be deposited, being in a volatile state, to the plasma.

With regards to **claim 27**, Ichibara et al. teaches an apparatus according to claim 20, wherein the sputtering electrode is provided with the fluid supply channel (see ¶130, supply channel as the gaseous AlSb target path towards destination using sputtering methods).

With regards to **claim 30**, Ichibara et al. teaches an apparatus according to **claim 20**, wherein a wall of the process chamber is provided with a passage to pass the substrate into and/or out of the process chamber (if substrate is in the

process chamber, there must have been a passage that the substrate went through to reach it's destination).

With regards to **claim 34**, Ichibara et al. teaches an apparatus according to **claim 20**, wherein the first and/or second deposition material is vapor deposited on the substrate (see ¶57, CVD may be utilized).

With regards to **claim 35**, Ichibara et al. teaches an apparatus according to **claim 20**, further comprising a separate sputtering source configured to sputter material onto the substrate (see ¶130, sputtering device available).

With regards to **claim 36**, Ichibara et al. teaches a method according to **claim 1**, wherein the first deposition material is ZnS and the second deposition material is SiO_2 (see ¶130, ZnS / SiO_2 material utilized).

4. **Claim 10** is rejected under 35 U.S.C. 103(a) as being unpatentable over Ichibara et al. and Chistyakov as applied to **claim 1** above, and further in view of Sakai et al. (Pub No. US 2002/0016017 A1, hereinafter Sakai et al.).

With regards to **claim 10**, Ichibara et al. and Chistyakov teach the limitations of **claim 1** for the reasons above.

Ichibara et al. and Chistyakov, however, does not teach the substrate moving so that different parts of substrate contacts the plasma.

In the same field of endeavor, Sakai et al. teaches ho moving a substrate in a plasma CVD process is advantageous since this will form a film which is continuously and uniformly formed on the substrate (see ¶19).

5. **Claim 16** is rejected under 35 U.S.C. 103(a) as being unpatentable over Ichibara et al. and Chistyakov as applied to **claim 1** above, and further in view of Sasaki et al. (USP# 7,081,272 B2, hereinafter Sasaki et al.).

With regards to **claim 16**, Ichibara et al. and Chistyakov teach the limitations of **claim 1** for the reasons above.

Ichibara et al. and Chistyakov, however, does not teach the film to be porous.

In the same field of endeavor, Sasaki et al. teaches how porous thin films are advantageous in that it will prevent glaring and for improving the light transmittance (see col. 24, lines 20-42).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to incorporate a porous layer in order to prevent glaring effects and for improving the light transmittance as taught by Sasaki et al.

6. **Claim 28** rejected under 35 U.S.C. 103(a) as being unpatentable over Ichibara et al. and Chistyakov as applied to **claim 20** above, and further in view of Vijayen et al. (Pub No. US 2003/0152746 A1, hereinafter Vijayen et al.).

Ichibara et al. and Chistyakov do not teach An apparatus according to claim 20, further comprising

two DC plasma cascade sources configured to generate two plasmas, wherein the two DC plasma cascade sources and the substrate positioning device are positioned such that, during use, opposite sides of the substrate contact the

plasmas generated by the two DC plasma cascade sources to deposit material on the opposite sides of the substrate

In the same field of endeavor, Vijayen et al. teaches how two plasma beam sources can be used to coat opposite sides of the substrate simultaneously (see ¶67).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to incorporate a plasma deposition system where both sides of the substrate are coated using two plasma sources (Ichibara et al. teaches DC plasma). This would allow uniform and complete covering of the coating on the wafer for semiconductor processes.

7. **Claim 29** is rejected under 35 U.S.C. 103(a) as being unpatentable over Ichibara et al. and Chistyakov as applied to **claim 20** above, and further in view of Williams et al. (USP# 5,468,520, hereinafter Williams et al.).

With regards to **claim 20**, Ichibara et al. and Chistyakov teach limitations of claim 20 for the reasons above.

Ichibara et al. and Chistyakov, however, does not teach an apparatus according to **claim 20**, further comprising a substrate supply roller and discharge roller, respectively, configured to supply and discharge, respectively, a substrate that can be rolled up to and from the process chamber, respectively.

In the same field of endeavor, Williams et al. teaches a roller system whereby a substrate can enter and leave the process chamber (see Fig. 3, substrate on rollers will enter and leave the process plasma chamber).

8. **Claims 31-33** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ichibara et al. and Chistyakov as applied to **claim 20** above, and further in view of Guerra (Pub No. US 2003/0228727 A1, hereinafter Guerra).

With regards to **claim 31**, Ichibara et al. and Chistyakov teach limitations of **claim 30** for reasons above.

Ichibara et al. and Chistyakov, however, does not teach an apparatus according to **claim 30**, wherein at least apart of the passage the process chamber wall is bounded by oppositely arranged feed-through rollers configured to engage a part of the substrate disposed between them during use, for feed-through of the substrate

In the same field of endeavor, Guerra teaches rollers which engage on the substrate to deform the substrate thus causing corrugation shaped substrates with a sputtering chamber (see Fig. 6, ¶131).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made since the position of the rollers

whether it be inside or outside would not have modified the operation of the device. One of ordinary skill in the art would have recognized that the rollers could also be incorporated within the chamber (see *In re Japiske*, 181 F.2d 1019, 86 USPQ 70 (CCPA 1950)).

With regards to **claim 32**, Guerra teaches an apparatus according to **claim 29**, further comprising a deformation means member configured to deform the substrate which has unrolled form the supply roller (see Fig. 6, deformation means **53**).

With regards to **claim 33**, Guerra teaches an apparatus according to **claim 32**, wherein the deformation member is configured to corrugate and/or serrate the substrate (see Fig. 6, substrate corrugated).

9. **Claim 37** is rejected under 35 U.S.C. 103(a) as being unpatentable over Ichibara et al. and Chistyakov as applied to **claim 1** above, and further in view of Shibata.

With regards to **claim 37**, Ichibara et al. and Chistyakov teaches the limitations of **claim 1** for the reasons above.

Ichibara et al. and Chistyakov, however, does not teach a method according to **claim 1**, wherein the first deposition material is MgF_2 and the second deposition material is TiO_2.

In the same field of endeavor, Shibata teaches how MgF_2 and TiO_2 may be deposited using a plasma method (see ¶64).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to utilize plasma processes to deposit MgF_2 and TiO_2 since this has been made well-known and demonstrated by Shibata that a plasma process can deposit such materials. Furthermore, such selection of well-known materials do not hold patentable weight unless criticality of the selection of materials are clearly disclosed within the specification (see *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960)).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAE LEE whose telephone number is (571)270-1224. The examiner can normally be reached on Monday - Friday, 7:30 a.m. - 5:00 p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Richards can be reached on 571-272-1736. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jae Lee/
Examiner, Art Unit 2895

JML

/N. Drew Richards/
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